

	A	B	C	D	E	F	G	H	I	J	K	L
1				Background Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	Date/Time of Computation			7/30/2013 11:02:08 AM								
4	From File			WorkSheet.xls								
5	Full Precision			OFF								
6	Confidence Coefficient			95%								
7	Coverage			95%								
8	rent or Future K Observations			1								
9	mber of Bootstrap Operations			2000								
10												
11	BEHP											
12												
13	General Statistics											
14	Total Number of Observations				66	Number of Missing Observations				0		
15	Number of Distinct Observations				51							
16	Number of Detects				51	Number of Non-Detects				15		
17	Number of Distinct Detects				44	Number of Distinct Non-Detects				10		
18	Minimum Detect				4.2	Minimum Non-Detect				3.2		
19	Maximum Detect				240	Maximum Non-Detect				31		
20	Variance Detected				2434	Percent Non-Detects				22.73%		
21	Mean Detected				49.62	SD Detected				49.33		
22	Mean of Detected Logged Data				3.485	SD of Detected Logged Data				0.967		
23												
24	Critical Values for Background Threshold Values (BTVs)											
25	Tolerance Factor K (For UTL)				1.997	d2max (for USL)				3.062		
26												
27	Normal GOF Test on Detects Only											
28	Shapiro Wilk Test Statistic				0.767	Normal GOF Test on Detected Observations Only						
29	5% Shapiro Wilk P Value				2.898E-10	Data Not Normal at 5% Significance Level						
30	Lilliefors Test Statistic				0.192	Lilliefors GOF Test						
31	5% Lilliefors Critical Value				0.124	Data Not Normal at 5% Significance Level						
32	Data Not Normal at 5% Significance Level											
33												
34	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
35	Mean				40.76	SD				46.06		
36	95% UTL95% Coverage				132.7	95% KM UPL (t)				118.2		
37	90% KM Percentile (z)				99.78	95% KM Percentile (z)				116.5		
38	99% KM Percentile (z)				147.9	95% KM USL				181.8		
39												
40	DL/2 Substitution Background Statistics Assuming Normal Distribution											
41	Mean				40.77	SD				46.32		
42	95% UTL95% Coverage				133.3	95% UPL (t)				118.6		
43	90% Percentile (z)				100.1	95% Percentile (z)				117		
44	99% Percentile (z)				148.5	95% USL				182.6		
45	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
46												
47	Gamma GOF Tests on Detected Observations Only											
48	A-D Test Statistic				0.463	Anderson-Darling GOF Test						
49	5% A-D Critical Value				0.772	ected data appear Gamma Distributed at 5% Significance Lev						
50	K-S Test Statistic				0.0856	Kolmogrov-Smirnoff GOF						
51	5% K-S Critical Value				0.127	ected data appear Gamma Distributed at 5% Significance Lev						
52	Detected data appear Gamma Distributed at 5% Significance Level											
53												
54	Gamma Statistics on Detected Data Only											
55	k hat (MLE)				1.335	k star (bias corrected MLE)				1.27		
56	Theta hat (MLE)				37.16	Theta star (bias corrected MLE)				39.08		
57	nu hat (MLE)				136.2	nu star (bias corrected)				129.5		
58	MLE Mean (bias corrected)				49.62							
59	MLE Sd (bias corrected)				44.03	95% Percentile of Chisquare (2k)				6.999		
60												
61	Gamma ROS Statistics using Imputed Non-Detects											
62	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											

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63	GROS may not be used when kstar of detected data is small such as < 0.1											
64	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
65	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
66	Minimum				0.01	Mean				39.09		
67	Maximum				240	Median				23.5		
68	SD				47.52	CV				1.216		
69	k hat (MLE)				0.48	k star (bias corrected MLE)				0.468		
70	Theta hat (MLE)				81.5	Theta star (bias corrected MLE)				83.53		
71	nu hat (MLE)				63.31	nu star (bias corrected)				61.77		
72	MLE Mean (bias corrected)				39.09	MLE Sd (bias corrected)				57.14		
73	95% Percentile of Chisquare (2k)				3.681	90% Percentile				107.2		
74	95% Percentile				153.7	99% Percentile				268.9		
75	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
76	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
77					WH	HW					WH	HW
78	Approx. Gamma UTL with 95% Coverage				181.7	225.3	95% Approx. Gamma UPL				141.7	167
79	95% Gamma USL				370.2	538.4						
80												
81	The following statistics are computed using gamma distribution and KM estimates											
82	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
83	k hat (KM)				0.783	nu hat (KM)				103.4		
84					WH	HW					WH	HW
85	Approx. Gamma UTL with 95% Coverage				144.3	151.8	95% Approx. Gamma UPL				117.7	121.1
86	95% Gamma USL				262.9	299.3						
87												
88	Lognormal GOF Test on Detected Observations Only											
89	Lilliefors Test Statistic				0.0737	Lilliefors GOF Test						
90	5% Lilliefors Critical Value				0.124	Detected Data appear Lognormal at 5% Significance Level						
91	Detected Data appear Lognormal at 5% Significance Level											
92												
93	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
94	Mean in Original Scale				40.59	Mean in Log Scale				3.19		
95	SD in Original Scale				46.44	SD in Log Scale				1.039		
96	95% UTL95% Coverage				193.4	95% BCA UTL95% Coverage				195		
97	95% Bootstrap (%) UTL95% Coverage				195	95% UPL (t)				139.3		
98	90% Percentile (z)				91.96	95% Percentile (z)				134.1		
99	99% Percentile (z)				272.3	95% USL				584.9		
100												
101	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
102	KM Mean of Logged Data				3.176	95% KM UTL (Lognormal)95% Coverage				203.3		
103	KM SD of Logged Data				1.071	95% KM UPL (Lognormal)				145		
104	95% KM Percentile Lognormal (z)				139.4	95% KM USL (Lognormal)				636.3		
105												
106	Background DL/2 Statistics Assuming Lognormal Distribution											
107	Mean in Original Scale				40.77	Mean in Log Scale				3.207		
108	SD in Original Scale				46.32	SD in Log Scale				1.028		
109	95% UTL95% Coverage				192.5	95% UPL (t)				139.2		
110	90% Percentile (z)				92.26	95% Percentile (z)				134		
111	99% Percentile (z)				270.1	95% USL				575.6		
112	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
113												
114	Nonparametric Distribution Free Background Statistics											
115	Data appear to follow a Discernible Distribution at 5% Significance Level											
116												
117	Nonparametric Uppper Limits for BTVs(no distinction made between detects and nondetects)											
118	Order of Statistic, r				65	95% UTL with95% Coverage				200		
119	Approximate f				1.711	Confidence Coefficient (CC) achieved by UTL				0.848		
120	95% UPL				159	95% USL				240		
121	95% KM Chebyshev UPL				243							
122												
123	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
124	data set free of outliers and consists of observations collected from clean unimpacted locations.											

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125	The use of USL tends to provide a balance between false positives and false negatives provided the data											
126	represents a background data set and when many onsite observations need to be compared with the BTV.											
127												